Reg.No: | | | | | | | |

SNS College of Technology, Coimbatore-35.

(An Autonomous Institution)
Internal Assessment -I
Academic Year 2024 -2025 (Odd)
Fifth Semester
19MAT301-Discrete Mathematics
(REGULATION 2019)
Common to CSE , IT & AIML

A

Time: 1.30 Hours **Maximum Marks: 50**

		PART – A (5 x 2 = 10 MARKS) ANSWER ALL QUESTIONS	CO	Blooms
1.		Construct the truth table for $(P \wedge Q)$ and $(Q \vee P)$.	CO1	(Und)
2.		Give the Contra positive for the statement "If it rains then the crops will grow".	CO1	(Und)
3.		Write the Quantifiers for " Every apple is red " .	CO1	(Und)
4.		List out the application of pigeonhole principle.	CO2	(Rem)
5.		State the Principle of Mathematical induction.	CO2	(Rem)
		PART –B (13+13+14 = 40 MARKS) ANSWER ALL QUESTIONS		
6.	a) i)	Show that $(P \wedge Q) \wedge \neg(P \vee Q)$ is a Contradiction.	CO1	(App) (7)
	ii)	Show that $R \rightarrow S$ can be derived from the premises $P \rightarrow (Q \rightarrow S)$, $\neg R \vee P$ and Q.	CO1	(App) (6)
		(OR)		
	b) i)	Without using truth table show that $\neg(P \wedge Q) \rightarrow (\neg P \vee (\neg P \vee Q)) \Leftrightarrow \neg P \vee Q$	CO1	(App) (7)
	ii)	Obtain the PDNF of $P \rightarrow ((P \rightarrow Q) \wedge \neg(\neg Q \vee \neg P))$ and also find its PCNF.	CO1	(App) (6)
7.	a) i)	Show that $R \rightarrow \neg Q$, $R \vee S$, $S \rightarrow \neg Q$, $P \rightarrow Q \Rightarrow \neg P$ by indirect method.	CO1	(App) (7)
	ii)	Prove that the premises $P \rightarrow Q$, $Q \rightarrow R$, $S \rightarrow \neg R$ and $P \wedge S$ are inconsistent.	CO1	(App) (6)
		(OR)		
	b) i)	Prove that $\frac{1}{1.2} + \frac{1}{2.3} + \frac{1}{3.4} + \ldots + \frac{1}{n(n+1)} = \frac{n}{n+1}$	CO2	(App) (7)
	ii)	Use Mathematical Induction to prove that $8^n - 3^n$ is a multiple of 5.	CO2	(App) (6)
8.	a)	Show that the premises " one student in this class knows how to write programs in java". "Everyone who knows how to write program in java can get a high - paying job" imply the conclusion "Someone in this class can get a high - paying job " .	CO1	(Ana) (14)
		(OR)		
	b) i)	Prove by mathematical induction $\sum_{k=1}^{n} k^2 = \frac{n(n+1)(2n+1)}{6}$	CO2	(App) (10)
	ii)	State pigeon hole principle and prove that 25 dictionaries in a library contain a total of 40,325 pages, then one of the dictionaries must have atleast 1614 pages, which statisfies the pigeon hole principle.	CO2	(Ana) (4)

Rem/Und: Remember/ Understand **App:** Apply **Ana:** Analyze **Eva:** Evaluate

Cre: Create

Prepared by **Verified by** **Dean(S&H)**

SNS GROUP OF INSTITUTIONS

Coimbatore–641029

Center for Learning and Teaching

Institution	SNS COLLEGE OF TECHNOLOGY
Branch	Mathematics
Academic Year	2024 -2025 (Odd)
Semester	V
Course Code/Name	19MAT301 - Discrete Mathematics (IAE 1 - SET A)
Name of the Faculty	Ms.C.Saranya

S.No	Quality Parameters based on blooms	Grade points (g)	Part	No.of Questions (n)	Allotted marks (m)	n*m	Q= n*m*g
1	Remember/ Understand (Level-1,2)	1	A	5	2	10	10
			B	-	-	-	-
			C	-	-	-	-
2	Apply (Level-3)	2	A	-	-	-	-
			B	4	6	24	48
				4	7	28	56
				1	10	10	20
			C	-	-	-	-
3	Analyze (Level-4)	3	A	-	-	-	-
			B	1	4	4	12
				1	14	14	42
			C	-	-	-	-
4	Evaluate (Level-5)	4	A	-	-	-	-
			B	-	-	-	-
			C	-	-	-	-
5	Create (Level-6)	5	A	-	-	-	-
			B	-	-	-	-
			C	-	-	-	-

Quality Index $Qi = \frac{\sum Q}{\sum(nxm)}$ = 188/90= 2.09 (Medium)

Faculty Teaching Coordinator HoD/Dean